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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/786,554

02/26/2004

Shintaro Takehara

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04/17/2008

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ALEXANDRIA, VA 22314

EXAMINER

HEYI, HENOK G

ART UNIT

PAPER NUMBER

2627

NOTIFICATION DATE

DELIVERY MODE

04/17/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/786,554	<b>Applicant(s)</b> TAKEHARA, SHINTARO	
	<b>Examiner</b> HENOK G. HEYI	<b>Art Unit</b> 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-9,11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/18/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

***Response to  
Argument***

Applicant's argument that the optimization of a range through routine experimentation is improper because result effective variables are not thought or suggested in the Ma reference is not persuasive. As it is shown in Fig. 8, f2 is a frequency that corresponds to the shortest pit or mark and at higher frequencies the gain attenuates. To have the gain set at 15dB for the f2 frequency and then fall to -3dB at a frequency three times the f2 frequency is merely the optimization of result effective variables.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 6, 8-14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. US 7,102,967 B1, (Ma hereinafter).

Regarding Claim 1, Ma teaches a disk apparatus for reproducing a disk on which information is recorded by pits or marks with various lengths (regardless of the lengths of pits or marks; see column 6, line 1), comprising: a photodetection unit configured to divisionally detect light reflected by the disk as a plurality of photodetection signals (four photodetector elements A, B, C, and D; see figure 3); and a tracking error signal

generation unit configured to generate a tracking error signal on the basis of a phase difference between the plurality of photo-detection signals detected by the photodetection unit (see figure 3), wherein the tracking error signal generation unit includes: an equalization unit configured to equalize waveforms of the plurality of photodetection signals detected by the photodetection unit (equalizers 306a and 306b; see figure 3). Ma discloses the language related to the gain being high at the shortest pit and then attenuating. As shown in Fig. 8, the maximum gain occurs at a frequency  $f_2$  corresponding to a shortest pit or mark, and second frequency-gain characteristics in which the gain attenuates within a frequency band not less than the frequency corresponding to the shortest pit or mark, and third frequency-gain characteristics that obtain a much lower gain at a frequency three times the frequency corresponding to the shortest pit or mark (see Fig. 8). It would have been obvious to one skilled in the art at the time the invention was made to control the gain to be 15dB at the  $f_2$  frequency and then fall to a gain of -3dB at a frequency three times the  $f_2$  frequency through routine experimentation and optimization to discover the optimum range since Ma et al. disclose the general condition for the equalizer having a gain for a frequency close to  $f_2$  and attenuation after  $f_2$  (see column 7, line 63 to column 8, line 3 and also figure 8).

Regarding Claims 3, as applied to claims 1 above, Ma et al. also teach the equalization unit includes: a high-pass filter (figure 8 shows the reinforcement of the high frequency component for a band of frequency in the vicinity of 12, this shows that the equalizer has a high pass filter included within) having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a

first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency, and a gain increases in a third frequency band between the first and second frequencies (see figure 8 and also note that this a general characteristic of high pass filters), and a low-pass filter (figure 8 shows attenuation after a certain band of frequency in the vicinity of  $f_2$ , this shows that the equalizer has a low pass filter included within) having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency (see figure 8 and also note that this a general characteristic of low pass filters).

Regarding Claim 5, Ma et al. teach the limitations claim 3 for the reasons discussed above. Ma et al. differ from the claimed invention in that the first frequency range is a frequency range 0.5 to 1.5 times a frequency corresponding to a pit or mark with which a reproduction signal amplitude saturates, the second frequency range is a frequency range 0.5 to 1.5 times the frequency corresponding to the shortest pit or mark, the third frequency matches the frequency corresponding to the shortest pit or mark, and a Q value of the low-pass filter is not less than 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust/modify the frequency ranges to be 0.5 to 1.5 times the frequency corresponding to the shortest pit and the Q factor to be greater than 2 in the system of Ma et al. after routine experimentation to discover the optimum range in order to increase the accuracy of tracking error detection since Ma et al. disclose the general condition for the filter frequencies as shown in figure 8 (note that no new structure is added, rather the optimum characteristics are detailed). Q factor is also a mere

mathematical expression that depends on variables such as frequency, resistance and capacitance of the filters. Additionally, it has been held that changes in size and shape of parts of an invention in the absence of an unexpected result involves routine skill in the art. See *In re Dailey*, 93 USPQ 47 (CCPA 1966).

Regarding Claim 6, as applied to claim 1 above, Ma et al. does not specifically disclose that the transfer function  $H$  of the equalization unit as given in the claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to formulate the transfer function as shown in the claim since it is merely a mathematical expression of the characteristics of the filters.

Regarding Claim 8, as applied to claim 1 above, Ma et al. also teach that the gain at the frequency corresponding to the shortest pit or mark is not less than 0 (the gain of the tracking error signal does not vary depending on the lengths of pits or marks; see column 8, lines 28-32 and 38-43).

Regarding Claims 9-14 and 16, method claims 9-14 and 16 are drawn to the method of using the corresponding apparatus, tracking error signal generation unit, claimed in claims 1, 3, 5, 6 and 8 with similar limitations. Therefore method claims 9-14 and 16 correspond to apparatus claims 1, 3, 5, 6 and 8 are rejected for the same reasons of obviousness as used above.

Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 7,102,967 B1) as applied to claims 5 and 13, above, further in view of Nobukuni et al. (US Publication 2001/0053115 A 1).

Regarding Claims 7 and 15, Ma et al. teach the limitations of claims 5 and 13 for the reasons discussed above. Ma et al. differ from the claimed invention in that it does not specifically show the ratio of the shortest pit to the pit or mark for which the reproduction signal amplitude saturates is 2:8. Nobukuni et al. on the other hand teach (1, 7) RLL-NRZI modulation with a mark length of 2T for short pits and 8T for long pits (see page 1, paragraph [0015], lines 9-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used RLL (1, 7) modulation for high density disks since Nobukuni et al. teach that the (1, 7) RLL - NRZI modulation is known as a modulation method for high-density mark length modulation recording (see page 1, paragraph [0015], lines 10-12).

### **Contact**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henok Heyi whose telephone number is (571) 270-1816. The examiner can normally be reached on Monday-Thursday 8:00-5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Henok Heyi/

April 11, 2008

/William Korzuch/

SPE, Art Unit 2627